Printed Pages : 1 **Roll No.** | | | | | | | | | | | **NIC042**

B. TECH.

THEORY EXAMINATION (SEM–VIII) 2016-17

ANALYTICAL INSTRUMENTATION

Time : 3 Hours ***Max. Marks : 100***

Note : *Be precise in your answer. In case of numerical problem assume data wherever not provided.*

SECTION-A

1 Explain the following: **(10×2=20)**

a) List elements of analytical instrumentation.
b) Give the unit of viscosity and density.
c) List electrode for PH measurement.
d) Define term: buffer solution.
e) What is electromagnetic radiation?
f) List detector used in Gas chromatograph. `
g) Give importance of chemical composition measurement in industry.
h) Give the name of reference electrode used in PH measurement.
i) Write full form of FID, FPD and ECD.
j) Give definition of viscosity.

SECTION-B

2 Attempt any five of the following: **(10×5=50)**

a) Draw and explain double UV visible spectrophotometer.
b) What is Raman Effect? Draw and explain Raman Spectroscopy.
c) Explain the basic principle of NMR and working of a NMR Spectrometer.
d) List of four detector used in Gas Chromatography and explain any one in detail.
e) Draw and explain working of Atomic Absorption spectrometer.
f) Explain the working of any one type Ion Source used in mass spectrometer.
g) Draw electromagnetic spectrum and describe the beer-lambert's law. Explain Flame ionization detector for gas chromatography.
h) Describe the colorimeter with neat sketch. What is pH? Describe reference electrode for pH measurement and explain electronic circuit of pH measurement.

SECTION-C

Attempt any two of the following: **(15×2=30)**

3 With a neat instrumentation setup, describe the principle of (IR) Infra-Red, spectrophotometer and the various components involved in it.

4 Explain the sample preparation, sample injection methods and separation process in gas chromatography.

5 In NMR spectroscopy, mention the advantages of using a magnet with as great a field strength as possible. Also explain the difference between a continuous wave and a Fourier transform NMR.